WHAT IS CLAIMED IS:

1. A non-aqueous electrolyte secondary battery comprising:

a negative electrode;

a positive electrode including a positive electrode active material capable of storage and release of lithium; and

a non-aqueous electrolyte, wherein

said positive electrode active material has a rock-salt structure containing lithium and is composed of an oxide containing magnesium substituted for part of lithium.

2. The non-aqueous electrolyte secondary battery according to Claim 1, wherein

said oxide is a lithium transition metal complex oxide expressed by a composition formula of $Li_aMg_bM1O_2$, where $a + 2b = 1$, $0 < a < 1$, and $0 < b < 0.5$, and where M1 is a metal of at least one type selected from the group consisting of cobalt, manganese, iron and nickel.

3. The non-aqueous electrolyte secondary battery according to Claim 1, wherein

said oxide is a lithium transition metal complex oxide expressed by a composition formula of $Li_aMg_bCoO_2$, where $a + 2b = 1$, $0 < a < 1$, and $0 < b < 0.5$.

4. The non-aqueous electrolyte secondary battery according to Claim 1, wherein

said magnesium is electrochemically substituted for said part of lithium in said oxide.

5. The non-aqueous electrolyte secondary battery according to Claim 1, wherein

said magnesium is electrochemically substituted for said part of lithium in said oxide using a non-aqueous electrolyte including an imide salt or a sulfonate in which a cation is magnesium.

6. The non-aqueous electrolyte secondary battery according to Claim 1, wherein

said magnesium is electrochemically substituted for said part of lithium in said oxide using a non-aqueous electrolyte including a sulfonyl imide salt in which a cation is magnesium.

7. A positive electrode active material capable of storage and release of lithium,

having a layered rock-salt structure containing lithium, and being composed of an oxide containing magnesium substituted for part of lithium.

8. The positive electrode active material according to Claim 7, wherein

said oxide is a lithium transition metal complex oxide expressed by a composition formula of $Li_aMg_bM1O_2$, where $a + 2b = 1$, $0 < a < 1$, and $0 < b < 0.5$, and where M1 is a metal of at least one type selected from the group consisting of cobalt, manganese, iron and nickel.

9. The positive electrode active material according to Claim 7, wherein

said oxide is a lithium transition metal complex oxide expressed by a composition formula of $Li_aMg_bCoO_2$, where $a + 2b = 1$, $0 < a < 1$, and $0 < b < 0.5$.

10. The positive electrode active material according to Claim 7, wherein

said magnesium is electrochemically substituted for said part of lithium in said oxide.

11. The positive electrode active material according to Claim 7, wherein

said magnesium is electrochemically substituted for said part of lithium in said oxide using a non-aqueous electrolyte including an imide salt or a sulfonate in which a cation is magnesium.

12. The positive electrode active material according to Claim 7, wherein

said magnesium is substituted for said part of lithium in said oxide using a non-aqueous electrolyte including a sulfonyl imide salt in which a cation is magnesium.

13. A method of manufacturing a positive electrode active material comprising the step of electrochemically substituting magnesium for part of lithium in an oxide having a layered rock-salt structure containing lithium.

14. The method of manufacturing a positive electrode active material according to Claim 13, wherein

said step of substituting includes the steps of:

preparing a cell in which a negative electrode and a positive electrode including said oxide are disposed in a non-aqueous electrolyte including a lithium salt;

extracting said part of lithium in said oxide by discharging said cell;

after extracting said part of lithium in said oxide, replacing the non-aqueous electrolyte including a lithium salt with a non-aqueous electrolyte including a magnesium salt; and

after said replacement of non-aqueous electrolyte, inserting magnesium into said oxide by discharging said cell.

15. The method of manufacturing a positive electrode active material according to Claim 13, wherein

said oxide includes a lithium transition metal complex oxide, and said transition metal includes at least one type of metal selected from the group consisting of cobalt, manganese, iron, and nickel.

16. The method of manufacturing a positive electrode active material according to Claim 13, wherein said oxide includes lithium cobaltate.

17. The method of manufacturing a positive electrode active material according to Claim 13, wherein

said step of substituting includes the step of electrochemically substituting magnesium for said part of lithium in said oxide using a non-aqueous electrolyte including an imide salt or a sulfonate in which a cation is magnesium.

18. The method of manufacturing a positive electrode active material according to Claim 13, wherein

said step of substituting includes the step of electrochemically substituting magnesium for said part of lithium in said oxide using a non-aqueous electrolyte including a sulfonyl imide salt in which a cation is magnesium.